LISTING OF CLAIMS:

Please amend the claims as follows:

1. (Cancelled) A method for balancing traffic across paths connecting a network to the Internet comprising:

forming a connection between a home network and a large network which connects to a plurality of networks, wherein said connection comprises a plurality of paths carrying traffic in the form of data packets between the home network and said large network, and wherein each path has a path load;

selecting one of said plurality of paths, wherein said plurality of paths comprises said selected path and other paths, and wherein said selected path has a traffic load and an initial overload;

measuring the amount of traffic from the home network to the large network over the selected path;

measuring the congestion over the selected path;

measuring the available capacity over the selected path;

choosing the path load for each of said plurality of paths using a fractional allocation strategy, wherein the time to generate information is minimized and the amount of traffic lost to overloads is minimized; and

distributing a portion of the traffic from the selected path to the other paths.

2. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the fractional allocation strategy comprises:

(a) associating the paths with a counter *i*, wherein the counter is a number equal to one (1) and there are a total of *j* paths;

(b) calculating the total initial selected path overload;

(c) calculating the selected path load, wherein the load is equal to the initial selected path overload less the sum of the low capacity boundary for *i* path(s);

(d) calculating the portion of the traffic on the selected path to be distributed using a bi-sectional search strategy;

(e) distributing a portion of the traffic on the selected path to the other paths; and

(f) stopping if there are no more paths ($i = j$), otherwise increasing the numerical value of the counter by one (1) and go to step (c).

3. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the portion of the traffic is distributed to the other paths using the equation

$$x_i = l_i + \frac{h_i - l_i}{\sum_{i=1}^{P}(h_i - l_i)} \times \left(x_0(0) - \sum_{i=1}^{P} l_i \right), \qquad (1)$$

wherein x_i is the path load, l_i is low capacity boundary, h_i is high capacity boundary, P is the total number of paths and $x_0(0)$ is the initial overload on the selected path.

4. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 2, wherein the portion of the traffic is distributed to the other paths using the equation

$$x_i = l_i + \frac{h_i - l_i}{\sum_{i=1}^{P}(h_i - l_i)} \mathrm{x} \left(x_0(0) - \sum_{i=1}^{P} l_i \right), \qquad (1)$$

wherein x_i is the path load, l_i is low capacity boundary, h_i is high capacity boundary, P is the total number of paths and $x_0(0)$ is the initial overload on the selected path.

5. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 2, wherein the bi-sectional search strategy uses a multidimensional iterative bisection search algorithm.

6. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the cost is measured using the equation $C = \sum_{t=1}^{T}\sum_{i=0}^{P}\left[x_i(t) - c_i(t)\right]^{+}$, and wherein C is the cost, T is the time period over which the feasible solution is obtained, P is the number of paths between the home network and the large network, x is path load and c is the capacity of the path at time t.

7. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the amount of traffic from the home network to the large network over the selected path is measured using flow level measurements or Simple Network Management Protocol (SNMP).

8. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the congestion over the selected path is measured using active probes, or passive measurements of traffic details.

9. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the congestion over the selected path is measured using Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time.

10. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the congestion over the selected path is measured using Round Trip Time (RTT), and loss measurements.

11. (Cancelled) The method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the available capacity over the selected path is measured using flow level measurements, Simple Network Management Protocol (SNMP) link measurements, Round Trip Time (RTT), loss measurements, active probes, or Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time.

12. (New) A method for balancing traffic across paths connecting a network to the Internet comprising:

forming a connection between a home network and a large network which connects to a plurality of networks, wherein the connection comprises a plurality of paths (p), carrying traffic in

the form of data packets between the home network and the large network, wherein each path has a path load (x_i), which is the amount of traffic allocated to a path (p), an available capacity (c_i), which is the amount of traffic that the path (p) can transmit, and a low capacity boundary (l_i) and a high capacity boundary (h_i), which are the measured high and low capacity bounds of the available capacity (c_i);

measuring the path load (x_i) of each of the plurality of paths (p);

measuring the high capacity boundary (h_i) of each of the plurality of paths (p);

comparing the path load (x_i) and the high capacity boundary ($h_i(0)$) for each of the plurality of paths (p);

selecting one of the plurality of paths (p), wherein the plurality of paths (p) comprises the selected path (p_0) and other paths (p_i), wherein the selected path (p_0) has an initial overload ($x_0(0)$), and wherein the overload exists when the initial selected path load (x_0) is greater than the initial selected path high capacity boundary (h_0); and

choosing the path load (x_i) for each of the plurality of other paths (p_i) using a fractional allocation strategy, wherein the fractional allocation strategy comprises:

(a) indexing the other paths (p_i) by i, wherein i is a set of integers from 1 to P, wherein P is the total number of other paths (p_i);

(b) associating a plurality of pinning intervals with a counter (t), wherein the initial value of the counter is set to zero ($t = 0$) and there are a total of N pinning intervals;

(c) calculating a portion ($y(t)$) of the initial selected path overload ($x_0(0)$) to be off-loaded and distributed to the other paths (p_i) using a bi-sectional search strategy and skipping to step (f);

(d) calculating an updated selected path overload ($x_0(t)$), wherein the updated selected path overload ($x_0(t)$) is equal to the initial selected path overload ($x_0(0)$) less the sum of the low capacity boundary for i path(s);

(e) calculating the portion ($y(t)$) of the updated selected path load ($x_0(t)$) to be off-loaded and distributed to the other paths (p_i) using a bi-sectional search strategy;

(f) measuring the low capacity boundary (l_i) and the high capacity boundary (h_i) of the other paths (p_i) at pinning interval (t);

(g) distributing the portion ($y(t)$) of the initial selected path overload or the updated selected path load ($x_0(t)$) to the other paths (p_i), wherein the portion of the traffic ($y(t)$) is distributed to the other paths (p_i) using the equation

$$x_i = l_i(t) + \frac{h_i(t) - l_i(t)}{\sum_{i=1}^{P}(h_i(t) - l_i(t))}\left(y(t)\right)$$

and

(h) stopping if there are no more pinning intervals ($t = N$), otherwise increasing the numerical value of the counter by one (1) and go to step (d).

13. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the bi-sectional search strategy chooses the portion ($y(t)$) of the traffic to be off-loaded and distributed using the equation:

$$y(t) = \min\left\{(0.5)\left[\sum_{i=1}^{P}(h_i(t) - l_i(t))\right], (x_0(t))\right\}.$$

14. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the amount of traffic from the home network to the large network over the selected path (p_0) is measured using flow level measurements or Simple Network Management Protocol (SNMP).

15. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ($h_0(0)$) is measured using active probes, or passive measurements of traffic details.

16. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ($h_0(0)$) is measured using Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time.

17. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ($h_0(0)$) is measured using Round Trip Time (RTT), and loss measurements.

18. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path low capacity boundary ($l_0(0)$ is equal to 0 and the initial selected path high capacity boundary ($h_0(0)$) is equal to 1.